



A.D. 1875, 14th JUNE. N° 2175.

Smoke Consuming Apparatus.

(This Invention received Provisional Protection only.)

PROVISIONAL SPECIFICATION left by William Edward Gedge at the Office of the Commissioners of Patents, with his Petition, on the 14th June 1875.—A communication from abroad by Paul Duboin, of Paris, France, Employé au Chemin de fer du Nord.

- 5 I, WILLIAM EDWARD GEDGE, of No. 11, Wellington Street, Strand, in the County of Middlesex, Patent Agent, do hereby declare the nature of the said Invention for "IMPROVEMENTS IN SMOKE CONSUMING APPARATUS," a communication to me from abroad by Paul Duboin, of Paris, France, Employé au Chemin de fer du Nord, to be as follows :—
- 10 The improvements, the subject of this Invention, consist in the particular arrangement of a fan which continuously drives the unburnt smoke and gasses over the flame in the fire-place in order that they may be entirely consumed. In this manner a real saving of fuel is obtained as well as the neutralization of this smoke, which inconveniences the
- 15 public and which may cause serious accidents, especially to locomotives and steamboats, in which the escape steam carries with it a thick smoke from the chimney, and even sometimes sparks and fine coal dust.

This improved apparatus is applicable to all kinds of generators, fixed

Gedge's Improved Smoke Consuming Apparatus.

or moveable, whether in factories, steamboats, locomotives, road and agricultural engines, compressor of macadam, bathing establishments, or elsewhere.

The fan upon which this system is based is arranged in a special manner, that is to say, that the suction of the smoke is effected on the one side, 5 and that of the air on the other.

The side which sucks or draws the smoke is of smaller section than that in which takes place the suction of the air necessary to the combustion of the smoke. This arrangement permits the obtaining of a greater quantity of air than of smoke, the burning of this latter being 10 thereby facilitated, it having a greater supply of oxygen at its disposition.

The suction of the smoke takes place by a conduit taking its smoke from a chamber or reservoir in order to have a supply of smoke sufficient to be sucked or drawn off by the fan in large quantity. The smoke is led by a conduit over the grate or fire-bars, in order to be again licked 15 up by the flames and fed by the air sent by the larger side of the fan and led beneath the grate, that is to say, into the ash pan, which is hermetically closed by a door permitting its easy cleansing. If required, the introduction of the smoke may be regulated by a small valve operated by a lever within reach of the fireman. 20

The fan may be worked by transmission gearing or by a separate motive-power engine.

In locomotives and compressors a special driving gear is used, as shown on the accompanying Sheet of Drawing, upon which—

Figure 1 is a longitudinalelevation of a locomotive engine with smoke 25 consuming apparatus embodying this Invention.

A, locomotive ; B, fan receiving its motion indirectly from the driving wheels of the machine itself. This fan is driven in the following manner :—Upon one of the wheels of the machine is placed a crank, to which is jointed a connecting rod with three heads, a , a^1 , a^{11} ; on the 30 above-mentioned crank of the wheel b is the head a of the rod, the second head a^1 is also placed upon a crank fixed on the wheel c , coupled to the wheel b ; and finally, the third head, a^{11} serves to actuate the wheel d , which drives the fan. The arm e of the connecting rod is indispensable in this driving gear, in order to keep the wheel d when at the dead 35 point from reversing its motion. The wheel d actuates a small cog f , communicating a rapid motion to the fan.

Gedge's Improved Smoke Consuming Apparatus.

In order that the fan may always rotate in the same direction when the course of the locomotive is changed, the wheels *g* and *h* are thrown in and out of gear by the lever *j* on the bar for reversing motion operating the clutch *i*. C, pipe or conduit for suction of the smoke;
5 D, smoke chamber or reservoir; E, valve worked by a bar within reach of the fireman, and serving to regulate the passage of the smoke; F, conduits through which the smoke is driven into the fire-place above its grate; G, pipe leading air beneath the grate into the ash box.

Figure 2 is a section through the fan.

10 Figure 3 is a longitudinal section of an ordinary generator A, upon which is placed the smoke consuming apparatus, composed of a double fan B, a smoke reservoir C placed at the back of the furnace; smoke suction pipe D; pipe E, through which the smoke is driven above the fire-grate; and pipe F, through which the air from the fan B arrives
15 beneath the fire-grate, in order to pass through the flame and feed the combustion of the coal and smoke.

Figures 4 and 5 represent a generator in longitudinal and in transverse section.

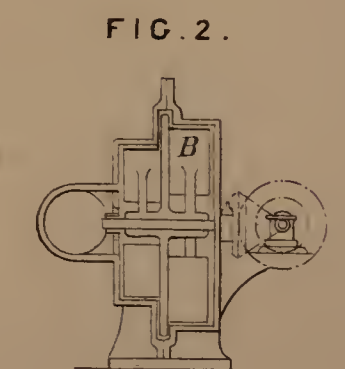
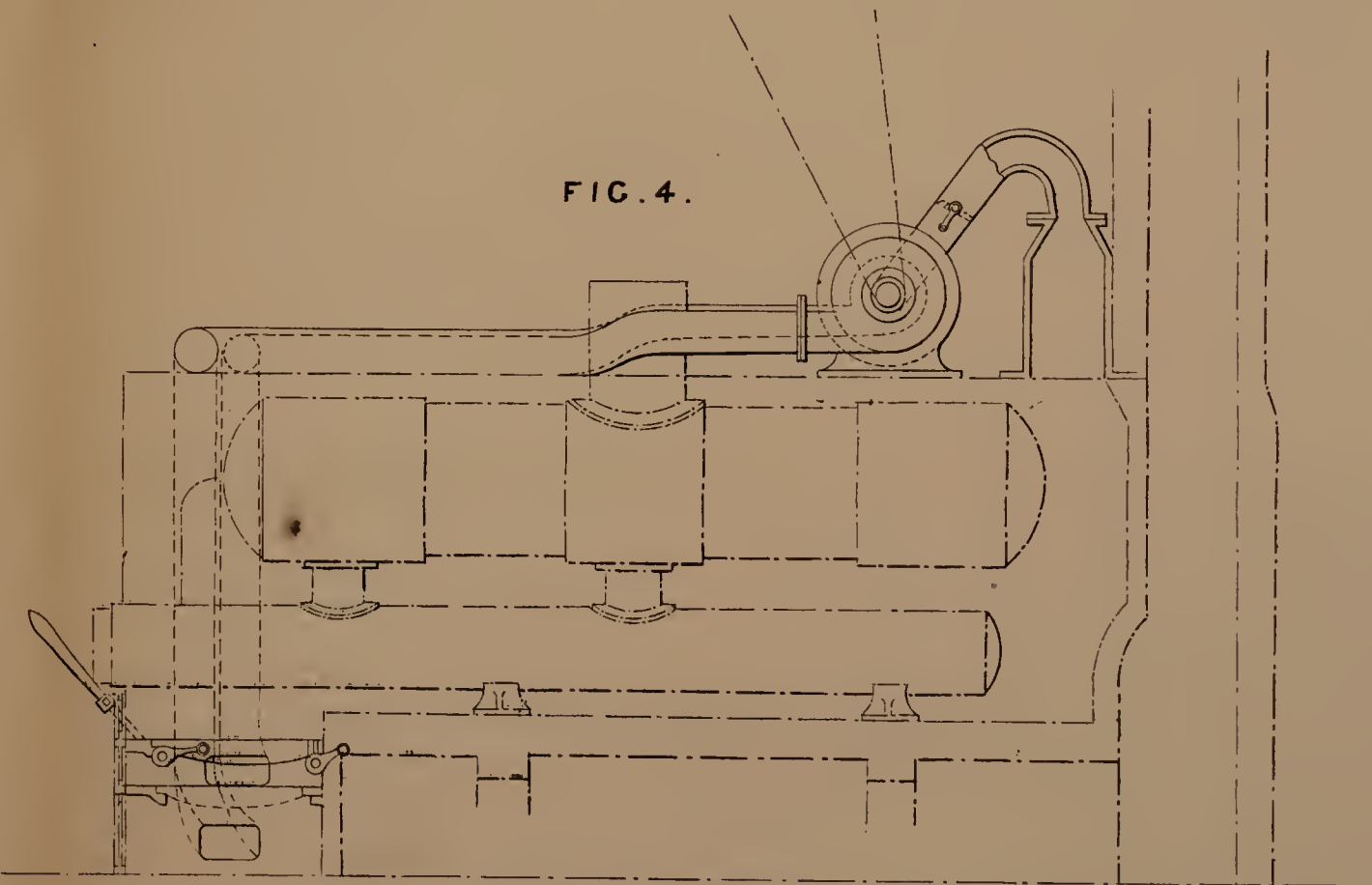
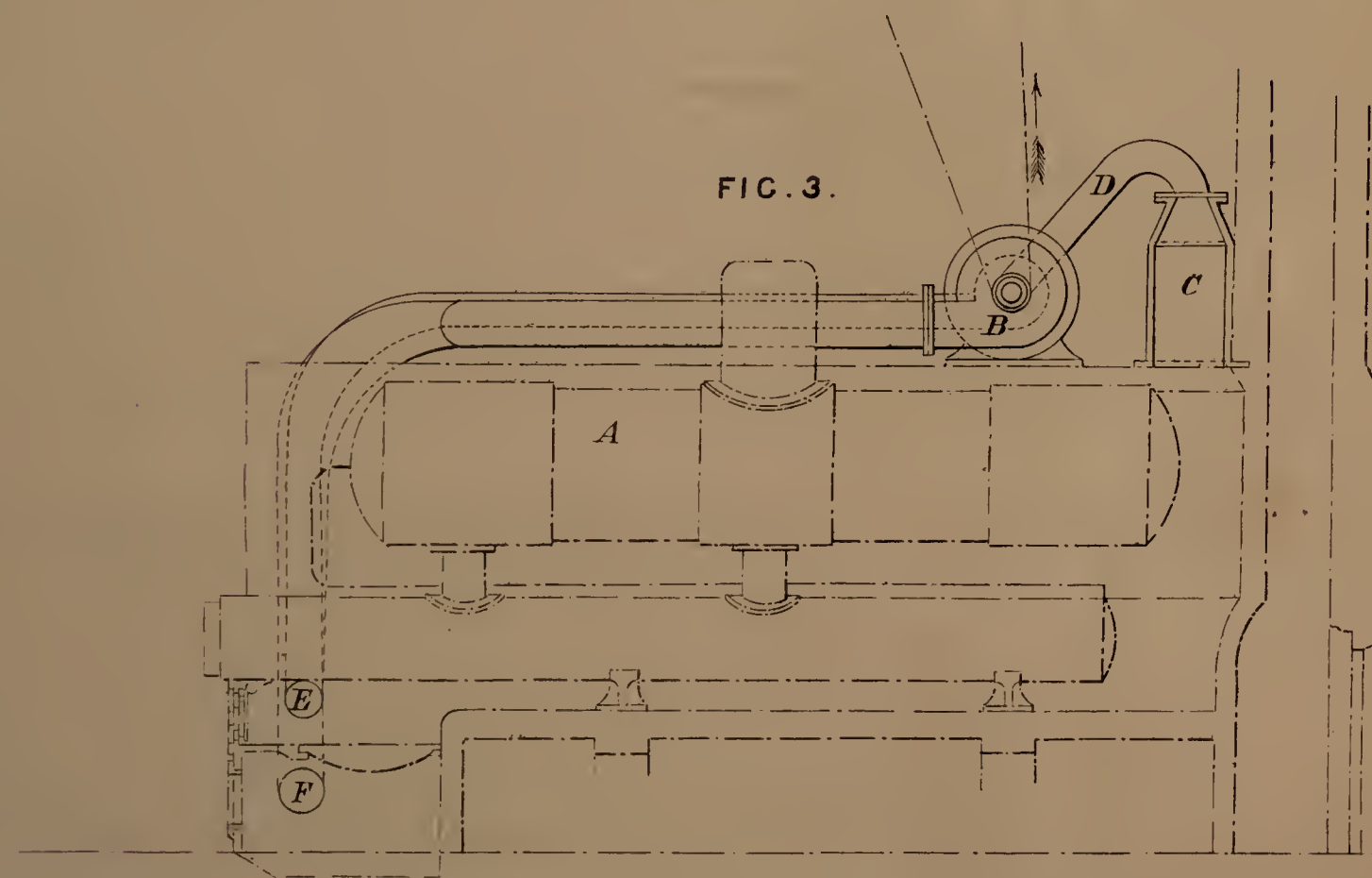
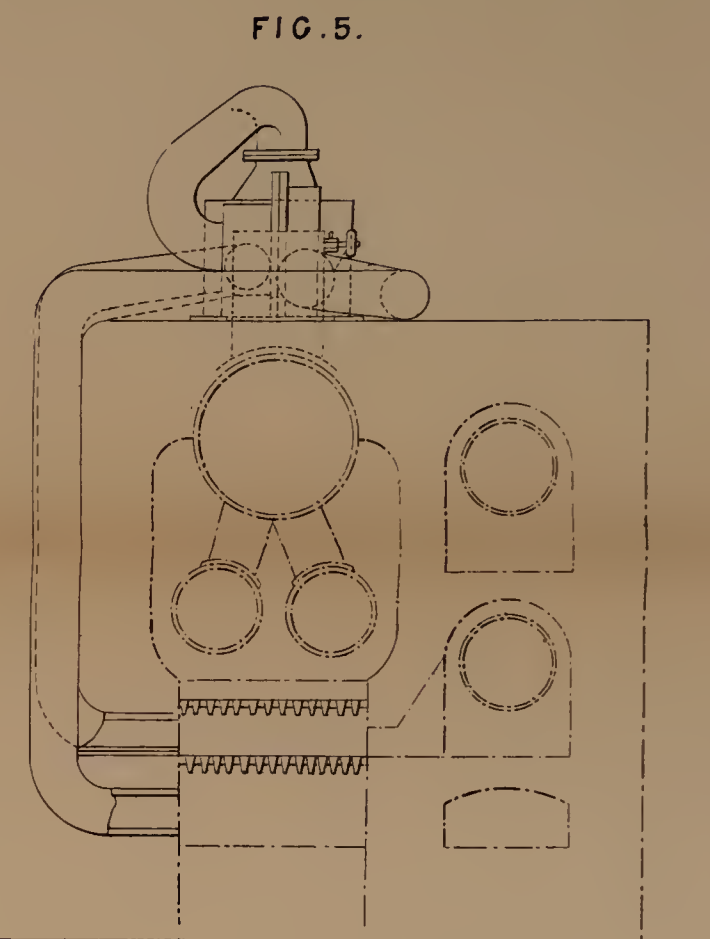
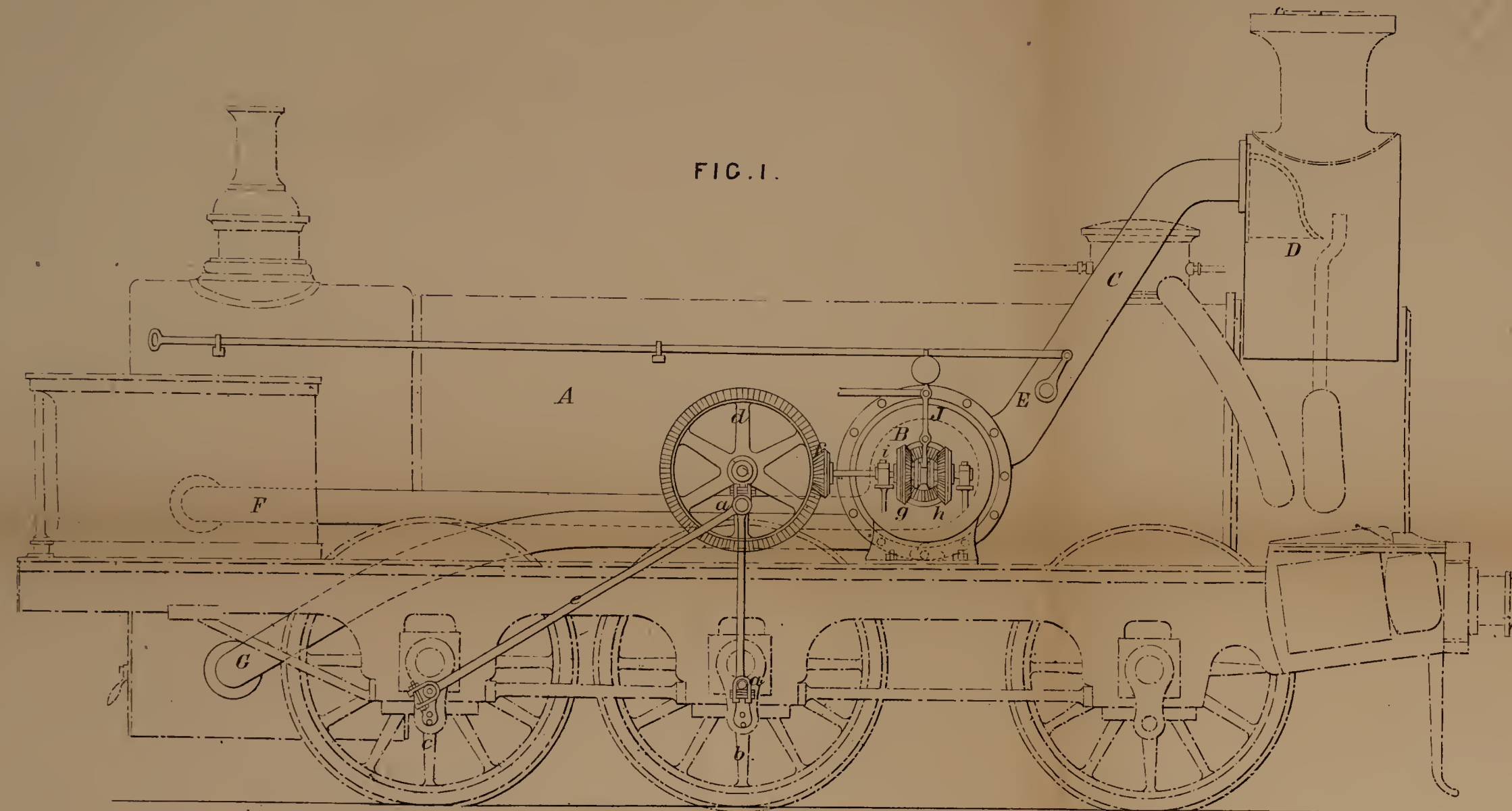
The fire-place is arranged in a special manner and possesses two grates
20 placed the one above the other. The first receives the fresh fuel, and the second the coal already burning, and which has given off its smoke in the first grate. This arrangement permits passing the smoke on its return through the second grate, and to utilise it by communicating its heat to the lateral boiler tubes placed at the side of the boiler, and then to pass
25 off freely by the chimney.

The first grate is arranged as follows:—A fixed bar next to a moveable one, so that there will be a series of moveable bars inserted between fixed bars.

The moveable bars are raised from time to time by means of a lever,
30 in order to pass on to the second grate coal already well burnt and containing but little gas; and it is this live coal which falling on to the second grate serves to kindle the smoke combined with air sent by the fan, and thus the smoke will be completely consumed.

LONDON:

Printed by GEORGE EDWARD EYRE and WILLIAM SPOTTISWOODE,
Printers to the Queen's most Excellent Majesty. 1875.



The drawing left with Provisional Specification is partly colored.

